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Abstract

This work analyses the effect of accruals quality in the access of firms to bank debt in a panel data of SME Spanish firms. The results show, even when we control for other determinants of bank debt and for the possible endogeneity between bank debt and accruals quality, a positive effect of accruals quality on bank debt, which suggests that higher precision of earnings reduces information asymmetries with banks and favours the access of firms to bank loans.

Keywords: accruals quality, bank debt, information asymmetry.

JEL Classification: G31, G32

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1. INTRODUCTION

This paper studies whether earnings of higher quality, i.e., more precise earnings with respect to cash flows, help firms to reduce information asymmetries with banks and thus allow them access to bank debt. The role of asymmetric information in bank debt contracting is an aspect of special interest in accounting and finance literature. In the presence of this market imperfection, financial institutions face adverse selection and moral hazard problems that make the assessment of the investment projects of their borrowers and the monitoring of their opportunistic behaviours difficult. As a consequence, firms with higher information asymmetry obtain less financing from financial institutions.

This concern becomes especially important in the case of small and medium sized firms. Given both their higher levels of asymmetric information (Berger and Udell, 1998) and their more debt-related agency conflicts (Smith and Warner, 1979) with respect to big firms, SMEs have more difficulties in accessing capital markets and obtaining financing (Titman and Wessels, 1988). In order to mitigate problems associated with their higher risk and asymmetric information, lenders demand higher returns and establish stronger contracting conditions for these firms.

Previous research has focused on the impact of asymmetric information as a determinant of bank debt from different points of view. The main findings of these studies are that bank debt is preferable to public debt when asymmetric information is present, due to the monitoring role on the borrower that banks may play (Johnson, 1997; Anderson and Makhija, 1999, Hooks, 2003; Denis and Mihov, 2003, among others); banking relationships are also valuable in obtaining bank financing, because of the information generated about the financial prospects of the borrowers (Petersen and Rajan, 1994; Berger and Udell, 1995; among others); finally, firm reputation may also reduce asymmetries (Diamond, 1991). On the other hand, precision of earnings has been shown to be a factor that, by reducing the information risk faced by lenders, improves debt contracting terms, such as the cost of debt financing (Francis, Lafond, Olsson and Schipper, 2005), the debt maturity structure of firms and the likelihood of providing collateral (Bharath, Sunder and Sunder, 2008).

Based on this previous research on the debt contracting consequences of earnings quality, this study focuses on the effects of accounting information quality on the access to bank debt. We argue that more precise earnings mitigate adverse selection costs by reducing information asymmetries (information risk) between the firm and the bank. As a consequence, we expect those firms with higher earnings quality to have easier access to bank loans.

In order to test our hypothesis we consider several accruals quality proxies (Dechow and Dichev, 2002; McNichols, 2002; Ball and Shivakumar, 2006) and test their effect on bank debt in a sample of Spanish SMEs. Spanish SMEs provide an excellent setting for the purpose of our study for several reasons. First, Spain has a banking oriented financial system where financial resources are channelled fundamentally by financial institutions (Schmidt and Tyrell, 1997), and where, in contrast to other European countries, the development of capital markets has been led by banks (Gallego, García and Saurina, 2002). Thus, bank loans constitute almost the only source of external funds for Spanish SMEs, which, besides, present higher asymmetric information than their counterparts from the wealthier northern European countries (Mulhern, 1995). Additionally, transaction-based lending in Spain is mainly focused on financial statements because others transaction-based lending technologies that exist in the UK and the US market, such as credit scoring and asset-based lending, are not available in Spain (Carbó-Valverde, Rodríguez-Fernández and Udell, 2009).

Our results show a positive association between our proxies of accruals quality and the proportion of bank debt over total debt and total assets, which suggests that the precision of earnings reduces information asymmetries between the firm and the bank in our institutional context. These findings provide valuable insights for managers since they suggest that by improving the quality of earnings firms can enhance their availability of debt financing, so allowing them to grow (Rajan and Zingales, 1998) and carry out positive net present value investment projects.

The paper is organized as follows: in the second section we present previous literature on the determinants of bank debt. The third section describes the research design. The fourth section covers the model specification. Results are discussed in the fifth section, and concluding comments end the paper.

2. THEORETICAL BACKGROUND

Asymmetric information and bank debt

The presence of asymmetric information between borrower and lender is traditionally used by financial literature to explain why capital does not always flow to firms with profitable investment opportunities (Stiglitz and Weiss, 1981). In this situation, creditors face adverse selection and moral hazard problems when granting credit. According to previous literature, banks are more effective in monitoring borrowers than other lenders, e.g., public debtholders, due to their closer relationship with the firms (Fama, 1985; Houston and James, 1996; Blackwell and Kidwell, 1988; Diamond, 1984 and 1991) and their ability to design and redesign contracts according to the characteristics of the borrower (Bharath et al., 2008). This better monitoring of borrowers aligns the interests of management and shareholders and limits moral hazard problems related to underinvestment (Myers, 1977), unprofitable investments (Hoshi et al., 1993), and asset substitution (Jensen and Meckling, 1976). According to Diamond (1991) and Yosha (1995), bank debt may also reduce information asymmetries with respect to public debt because bank financing signals positive information about a firm's credit quality and thus enhances the reputation of the firm.

Empirical studies have shown how information asymmetry influences the access of the firm to bank debt. On the one hand, firms with higher asymmetric information use more bank debt than public debt (Johnson, 1997; Anderson and KMakhija, 1999, Hooks, 2003; Denis and Mihov, 2003, among others), but on the other hand, for those firms that rely more on private debt, the reduction of information asymmetry facilitates access to bank debt, as shown by recent studies focused on Emerging and Continental countries dominated by private debt providers (Ojah and Manrique, 2005; de Andrés, López, Rodríguez and Vallelado, 2005).

Earnings quality and access to bank debt

Lending technologies used by financial institutions have important effects on SME credit availability. Financial statement lending is a transaction technology based on the strength of the borrower's financial statement. Banks use this accounting information in order to estimate the expected future cash flows of the borrowers, and then assess their repayment capacity (Berger and Udell, 2006). Financial statements are, therefore, an important source of information in mitigating the problems associated with borrower risk and asymmetric information: the higher the quality of this information, i.e., the more accurate the precision of earnings to capture future cash flows, the lower the information risk of the firm, because the lender can better estimate the future cash flows of the firm with which the loans will be repaid.

Previous research has verified that accruals increase the ability to predict future cash flows (Dechow, 1994; Subramanyan, 1996) and that the reduction of information risk due to higher accruals quality influences contract terms, such as interest cost, collateral and debt maturity (Francis et al., 2005; Bharath et al., 2008). Based on the results of these papers and on the negative association between information asymmetry and bank debt in private debt contexts, we establish the hypothesis that this reduction of information risk may influence not only the contract terms of the loans but also the access of the firm to these loans.

Other determinant factors of bank debt

The literature on bank debt has shown that factors such as size, age and growth opportunities are proxies of asymmetric information and firm's reputation that influence the levels of bank debt because of the information they generate about the financial expectations of the borrowers (Diamond, 1991; Petersen and Rajan, 1994; Berger and Udell, 1995; Ghosh, 2007). Larger and older firms present lower levels of asymmetric information and have better reputation (Berger and Udell, 1995), so it is expected they use more public debt than companies with higher levels of asymmetric information (Denis and Mihov, 2002). However, as De Andrés et al. (2005) point out, in civil law countries most firms, even large ones, rely almost exclusively on bank-borrowed funds, so the access to these funds in these contexts is negatively associated to information asymmetry. This association should be stronger when focusing on small and medium sized enterprises that have access only to private markets. Therefore, a positive association of size and age with bank debt is expected.

Asymmetric information may also provoke agency conflicts between debt holders and equity holders. In particular, firms with risky debt face underinvestment problems (Myers, 1977) and assets substitution (Jensen and Meckling, 1976), which can be reduced through efficient monitoring, such as that provided by banks. Thus, assuming that firms with greater growth options usually have more conflicts between shareholders and debt holders, a positive relationship between growth opportunities and the proportion of bank debt could be expected. However, it should also be taken into account that since bank supervision may reduce firms' financial flexibility, firms with growth opportunities would prefer not to use bank debt (De Andrés, et al, 2005) and instead finance their projects with their own resources. This negative association of growth opportunities with bank debt is also consistent with the attitude of Spanish SME as regards the distribution of earnings, because they usually retain all their profits. Accordingly, we should expect a negative relationship

Financial literature has also established the advantages of private debt over public debt in monitoring firms and the efficiency of liquidation and renegotiation in financial distress (Boyd and Prescott, 1986, Berlin and Loyes, 1988; Chemmanur and Fulghieri, 1994; Diamond, 1984), but this trade off is not applicable to our sample. In the case of SMEs where banks are the main providers of external funds, it is expected that more leveraged firms have more presence of bank debt in their balance sheets. In connection with growth, since firms with low profitability generate lower internal financing, they are more likely to finance their projects with more bank debt, in contrast to more profitable firms. Finally, the financial literature indicates the relevance of collaterals in reducing moral hazard problems under asymmetric information (Boot et al. 1991, Boot and Thakor, 1994), so a positive association between collateral and bank debt is expected.

3. SAMPLE AND DATA

We have used panel data from non-financial Spanish SMEs for our analysis. The principal source of information is the SABI (Spanish Balance Sheets Analysis System) database, which contains accounting and financial information of Spanish firms and which has been developed by Bureau Van Dijk. We selected industrial firms that during the period 1998-2005 maintained the SME conditions, according to the requirements established by European Commission recommendation 2003/361/EC of 6 May, 2003: they had fewer than 250 employees; turned over less than 50 million euros annually; and possessed less than 43 million euros worth of total assets. They should also present disaggregation of bank debt in their accounting statements. Subsequently, we refined the information, eliminating lost values, firms for which the information was not available for the five consecutive years[1] and cases with errors in the accounting data. Finally, we obtained a panel comprising 1,283 Spanish SMEs.

4. RESEARCH DESIGN

4.1. Model Specification

We analyze the relationship between band debt and accruals quality by estimating the following regression:

$$BANKDEBT_{it}=Intercept+\delta_1 AQ_{it}+\delta_2 GROWP_{it}+\delta_3 LEV_{it}+\delta_4 SIZE_{it}+\delta_5 FA_{it}+\delta_6 ROA_{it}+\delta_7 Altman\text{-}Z_{it}+ \delta_8 LAGE_{it} +\lambda_t+\varepsilon_{it} \quad (1)$$

[1] This is necessary for calculating some accruals quality proxies based on the standard deviation of residuals from t-4 to t.

BANKDEBT represents the proportion of firm's bank debt; AQ the accruals quality proxy; GROWP the growth opportunities; LEV the leverage; SIZE the size; FA the collateral, ROA the return on assets; Altman-Z, an indicator of firm's financial strength and LAGE the age of the firm. The parameters λ_t are time dummy variables that change over time but are equal for all firms in each of the time periods considered. In this way, we attempt to capture the economic variables that firms cannot control and which may affect the access to bank debt Since we estimate this model both with clusters at firm and year level (Petersen, 2009), and with fixed effects, in the second of these cases we also include in the model the variable η_i, which represents unobservable characteristics of the firms that have a significant impact on the firm's bank debt. These vary across firms but are assumed to be constant for each firm.

4.2. Variables Description

Dependent variables

We measure the financing received from banks using two different proxies. The first is BANKDEBT1, which is calculated as total bank debt over total assets. The second is BANKDEBT2, defined as total bank debt over total debt.

Accruals quality metrics

As regards accruals quality metrics, we use proxies which have been used extensively in research (Francis et al., 2005; Bhattacharya, Ecker, Olsson, and Schipper, 2007; Bharath et al., 2008). Like these studies, we focus on the accuracy with which accruals convey information about cash flows in order to inform stakeholders, particularly investors and creditors.

First, we use the model developed by Dechow and Dichev (2002). In this model, accruals quality is measured by the extent to which current working capital accruals map onto operating cash flows of the prior, current and future periods. Thus, Dechow and Dichev (2002) regress current working capital accruals (WCA_t) on cash flow from operations of the previous fiscal year (CFO_{t-1}), of the current year (CFO_t), and the subsequent fiscal year (CFO_{t+1}), all deflated by average total assets.

$$\frac{WCA_{it}}{AvgAssets_{it}}=\beta_0+\beta_1\frac{CFO_{i,t-1}}{AvgAssets_{it}}+\beta_2\frac{CFO_{i,t}}{AvgAssets_{it}}+\beta_3\frac{CFO_{i,t+1}}{AvgAssets_{it}}+\varepsilon_{it} \quad (2)$$

where:

WCA_{it} is working capital accruals of firm i in year t, calculated as the change in current assets *(ΔCA)*, minus the change in cash and cash equivalents *(ΔCash)*, minus the change in current liabilities *(ΔCL)* plus the change in short term bank debt *(ΔDebt)*.

CFO_{it}, CFO_{t-1}, and CFO_{t+1} signify cash flow from operations of firm i in years t, t-1 and t+1, respectively, calculated as the difference between net income before extraordinary items (*NIBE*) and total accruals (*TA*). Total accruals are calculated for each firm in year t, following Dechow, Sloan and Sweeney (1995), as working capital accruals (WCA_{it}) minus depreciation and amortization expenses for the period (Dep_{it}).

All variables are deflated by average total assets. Average total assets are calculated for firm i in year t as the mean of the firm's total assets in years t-1 and t. The model is estimated in its cross-sectional version for each industry-year combination, at two-digit level of the Spanish Classification of National Activities (CNAE). The residual vector reflects the variation in working capital accruals unexplained by cash flows of the previous, current and subsequent periods. Therefore, the absolute value of the residual for each firm-year observation is an inverse measure of accruals quality. ($IAQ\_DD_{it} = |\hat{\varepsilon}_{it}|$ (the higher the residual, the lower the accruals quality). In order to facilitate the interpretation of this variable we use the negative value of IAQ_DD_{it}, which we define as AQ_DD_{it}.

Our second proxy for accruals quality, following Francis et al. (2005), is Dechow and Dichev's (2002) model, modified by McNichols (2002), which also includes the changes in revenues and property, plant and equipment (*PPE*) as explanatory variables.

$$\frac{WCA_{it}}{AvgAssets_{it}} = \beta_0 + \beta_1 \frac{CFO_{i,t-1}}{AvgAssets_{it}} + \beta_2 \frac{CFO_{i,t}}{AvgAssets_{it}} + \beta_3 \frac{CFO_{i,t+1}}{AvgAssets_{it}} + \beta_4 \frac{\Delta REV_{it}}{AvgAssets_{it}} + \beta_5 \frac{PPE_{it}}{AvgAssets_{it}} + \varepsilon_{it} \quad (3)$$

where *ΔREV* is the change in revenues and *PPE* is the gross level of property, plant and equipment. The model is estimated in its cross-sectional version for each industry-year combination. The residual vector reflects the variation in working capital accruals unexplained by cash flows of the previous, current and subsequent period, changes in revenues and *PPE*. The absolute value of the residual for each firm-year observation is an inverse measure of accruals quality ($IAQ\_McN_{it} = |\hat{\varepsilon}_{it}|$). We use the negative value of IAQ_McN_{it}, defined as AQ_McN_{it}.

Our third proxy for accruals quality is calculated following the Ball and Shivakumar (2006) model, which includes three additional variables in the Dechow and Dichev (2002) model:

$$\frac{WCA_{it}}{AvgAssets_{it}} = \beta_0 + \beta_1 \frac{CFO_{i,t-1}}{AvgAssets_{it}} + \beta_2 \frac{CFO_{i,t}}{AvgAssets_{it}} + \beta_3 \frac{CFO_{i,t+1}}{AvgAssets_{it}} + \beta_4 \frac{\Delta CFO_{it}}{AvgAssets_{it}} + \beta_5 D + \beta_6 D \frac{\Delta CFO_{it}}{AvgAssets_{it}} + \varepsilon_{it} \quad (4)$$

where ΔCFO is the change in the cash flow from operations used as a proxy for gain or loss, D is a dummy variable which takes the value 1 if ΔCFO is negative and 0 otherwise, and $D\Delta CFO_{it}$ is the interaction between these two variables. This model tries to incorporate the asymmetry that can be recognised between gains and losses into the conventional linear accruals models. As in the previous models, the Ball and Shivakumar model is estimated in its cross-sectional version for each industry-year combination, and the absolute value of the residual for each firm-year observation is an inverse measure of accruals quality ($IAQ\_BS_{it} = |\hat{\varepsilon}_{it}|$). We also use the negative value of IAQ_BS_{it}, defined as AQ_BS_{it}.

The fourth, fifth and sixth proxies we use are based on the standard deviation of the residuals from the industry-year estimations of previous models estimated in equation 2 ($IAQ\_sdDD_{it} = \sigma(\hat{\varepsilon}_i)_t$), equation 3 ($IAQ\_sdMcN_{it} = \sigma(\hat{\varepsilon}_i)_t$) and equation 4 ($IAQ\_sdBS_{it} = \sigma(\hat{\varepsilon}_i)_t$) respectively. Instead of the absolute value of the residuals for each firm, we compute an inverse measure of accruals quality for firm i in year t as the standard deviation of firm i's residuals from the industry-year regressions, $\hat{\varepsilon}_{it}$, calculated over periods t-4 to t. Larger standard deviations of residuals indicate poorer accruals quality. We also use the negative values of IAQ_sdDD_{it}, IAQ_sdMcN_{it}, and IAQ_sdBS_{it}, defined as AQ_sdDD_{it}, AQ_sdMcN_{it}, and AQ_sdBS_{it}.

Control variables

As control variables, we use growth opportunities (GROWP), calculated as sales in year t over sales in years t-1, leverage (LEV), defined as total debt over total assets, size (SIZE), measured as the logarithm of assets, collateral (FA), defined as fixed assets over total assets, return on assets (ROA), measured as earnings before interests and taxes over total assets, distance to bankruptcy (Z), calculated using the Altman Z-score, and firm's age (AGE), defined as the logarithm of the number of years since its inception.

5. RESULTS

5.1. Descriptive statistics and preliminary analysis

Table I summarizes the descriptive statistics of our sample. The average presence of bank debt over total assets (BANKDEBT1) is 28.9%, whereas over total debt, bank debt represents 45.7% (BANKDEBT2). The mean value of leverage is 60.3%, whereas the mean value of fixed assets over total assets is 35.5% and the average Altman Z-score is 2.67. On average, the firms in the sample are profitable (mean ROA 6.8%), have a value of total assets of €10.7 million and are 26 years old. The mean values of the accruals quality proxies are consistent with previous literature.

Table I

Descriptive statistics

BANKDEBT1 is calculated as total bank debt over total assets. BANKDEBT2 is defined as total bank debt over total debt. AQ_DD reports the negative value of the $|\hat{\varepsilon}_{it}|$ according to the Dechow and Dichev model, AQ_McN according to Dechow and Dichev model modified by McNichols (2002); and AQ_BS according to the Ball and Shivakumar model. AQ_sdDD, AQ_sdMcN, and AQ_sdBS, report the negative value of the standard deviation of firm i's residuals from the industry-year regressions, $\hat{\varepsilon}_{it}$, calculated over periods t-4 to t for Dechow and Dichev model, Dechow and Dichev model modified by McNichols (2002), and Ball and Shivakumar model, respectively. Growth opportunities (GROWP) are calculated as sales in year t over sales in year t-1; leverage (LEV) is defined as total debt over total assets; size (SIZE) is measured as the logarithm of assets; collateral (FA) is defined as fixed assets over total assets; return on assets (ROA) is earnings before interests and taxes over total assets; distance to bankruptcy (Z) is calculated using the Altman Z-score; and firm's age (LAGE) is defined as the logarithm of the number of years since the inception.

	Mean	Std. Dev.	Perc. 25	Perc. 50	Perc. 75
BANKDEBT1	0.2891	0.1591	0.1634	0.2873	0.4088
BANKDEBT2	0.4570	0.1937	0.3243	0.4832	0.6008
AQ_DD	-0.0318	0.0292	-0.0436	-0.0241	-0.0113
AQ_McN	-0.0298	0.0269	-0.0411	-0.0230	-0.0108
AQ_BS	-0.0315	0.0288	-0.0430	-0.0240	-0.0113
AQ_sdDD	-0.0299	0.0207	-0.0387	-0.0254	-0.0160
AQ_sdMcN	-0.0276	0.0184	-0.0353	-0.0237	-0.0152
AQ_sdBS	-0.0286	0.0201	-0.0368	-0.0244	-0.0151
GROWP	1.0752	0.2398	0.9781	1.0550	1.1434
LEV	0.6030	0.1762	0.4845	0.6232	0.7363
SIZE	9.1091	0.5811	8.6869	9.0892	9.5317
FA	0.3547	0.1646	0.2303	0.3476	0.4612
ROA	0.0684	0.0671	0.0311	0.0580	0.0981
Altman-Z	2.6726	1.1138	1.9067	2.5161	3.2708
LAGE	3.1244	0.5318	2.7726	3.1355	3.4657

Table II presents the Pearson correlation matrix between variables. As expected, there is high and significant association between both variables of bank debt. Accruals quality proxies also show positive and significant correlations between them and with bank debt (in 10 out of 12 cases for the association with bank debt). Since higher values of accruals quality proxies represent higher accruals quality, these results present preliminary evidence of a positive association between accruals quality and bank debt. For independent variables, we only detect high correlation between leverage and Altman Z-score. Collinearity is a possible concern for these variables, which we will analyze in the robustness section, showing that it does not affect our results.

Table II
Correlation matrix

BANKDEBT1 is calculated as total bank debt over total assets. BANKDEBT2 is defined as total bank debt over total debt. AQ_DD reports the negative value of the $|\hat{\varepsilon}_{it}|$ according to the Dechow and Dichev model, AQ_McN according to Dechow and Dichev model modified by McNichols (2002); and AQ_BS according to the Ball and Shivakumar model. AQ_sdDD, AQ_sdMcN, and AQ_sdBS, report the negative value of the standard deviation of firm i's residuals from the industry-year regressions, $\hat{\varepsilon}_{it}$, calculated over periods t-4 to t for Dechow and Dichev model, Dechow and Dichev model modified by McNichols (2002), and Ball and Shivakumar model, respectively. Growth opportunities (GROWP) are calculated as sales in year t over sales in year t-1; leverage (LEV) is defined as total debt over total assets; size (SIZE) is measured as the logarithm of assets; collateral (FA) is defined as fixed assets over total assets; return on assets (ROA) is earnings before interests and taxes over total assets; distance to bankruptcy (Z) is calculated using the Altman Z-score; and firm's age (LAGE) is defined as the logarithm of the number of years since the inception.. ***, **, * denotes significance at the 1%, 5% and 10% level, respectively.

	BANKDEBT1	BANKDEBT2	AQ_DD	AQ_McN	AQ_BS	AQ_sdDD	AQ_sdMcN	AQ_sdBS	GROWP	LEV	SIZE	FA	ROA	Altman-Z	LAGE
BANKDEBT1	1														
BANKDEBT2	0.881***	1													
AQ_DD	0.0434***	0.0741***	1												
AQ_McN	0.0567***	0.0892***	0.8844***	1											
AQ_BS	0.039***	0.0672***	0.9775***	0.8695***	1										
AQ_sdDD	0.0197*	0.0571***	0.4385***	0.3901***	0.4318***	1									
AQ_sdMcN	0.0163	0.0676***	0.4051***	0.4257***	0.4005***	0.8135***	1								
AQ_sdBS	0.017	0.0573***	0.44***	0.3986***	0.4447***	0.8782***	0.86***	1							
GROWP	0.0040	-0.0420***	-0.0565***	-0.0347***	-0.0515***	-0.0680***	-0.0156	-0.0364***	1						
LEV	0.7334***	0.398***	-0.0043	-0.0055	-0.0053	-0.0351***	-0.0608***	-0.0382***	0.0791***	1					
SIZE	0.0673***	0.1116***	0.0392***	0.0395***	0.037***	0.013	0.0274**	0.0204*	0.0445***	-0.0629***	1				
FA	0.187***	0.2859***	0.0321***	0.0134	0.034***	0.028**	0.033***	0.0439***	-0.0301***	-0.0437***	0.1414***	1			
ROA	-0.3146***	-0.2837***	-0.0048	-0.0078	-0.0024	0.0225**	0.0427***	0.0475***	0.1808***	-0.2757***	-0.0333***	-0.1408***	1		
Altman-Z	-0.6983***	-0.5298***	-0.0135	-0.0101	-0.0114	0.0139	0.0281**	0.021*	0.0171	-0.7563***	-0.1347***	-0.2903***	0.5222***	1	
LAGE	-0.1114***	-0.0243**	0.0342***	0.0466***	0.0305***	0.0298***	0.0306***	0.0291**	-0.0743***	-0.2003***	0.1064***	-0.0524***	-0.0656***	0.1319***	1

In table III, panels A and B, we present the mean values of bank debt by quartiles of accruals quality, and the t test of difference between quartile 1 and 4. Quartile 1 shows the mean value of bank debt for firms with lowest accruals quality, whereas quartile 4 shows the mean value of bank debt for firms with highest accruals quality. In the last column of table III we include the t test to determine whether the mean values of quartile 1 are significantly different from those of quartile 4. The findings show, for all accruals quality metrics, significant differences between quartile 1 and 4, with higher presence of bank debt in those firms with higher accruals quality.

Table III

Bank debt by accruals quality quartiles

This table presents the mean values of the variables BANKDEBT1 and BANKDEBT2 for each quartile of accruals quality metrics. BANKDEBT1 is calculated as total bank debt over total assets. BANKDEBT2 is defined as total bank debt over total debt. AQ_DD reports the negative value of the $|\hat{\varepsilon}_{it}|$ according to the Dechow and Dichev model, AQ_McN according to Dechow and Dichev model modified by McNichols (2002), and AQ_BS according to the Ball and Shivakumar model. AQ_sdDD, AQ_sdMcN, and AQ_sdBS, report the negative values of the standard deviations of firm i's residuals from the industry-year regressions, $\hat{\varepsilon}_{it}$, calculated over periods t-4 to t for Dechow and Dichev model, Dechow and Dichev model modified by McNichols (2002), and Ball and Shivakumar model, respectively. t test determine whether the mean value of quartile 1 is significantly different from that of quartile 4.

PANEL A
(Dependent variable BANKDEBT1)

	C1	C2	C3	C4	*t*
AQ_DD	0.2774	0.2880	0.2955	0.2956	*-3.67****
AQ_McN	0.2739	0.2903	0.2918	0.2995	*-5.11****
AQ_BS	0.2785	0.2889	0.2949	0.2942	*-3.16****
AQ_sdDD	0.2806	0.2877	0.2867	0.2972	*-3.27****
AQ_sdMcN	0.2810	0.2898	0.2868	0.2936	*-2.35***
AQ_sdBS	0.2814	0.2898	0.2837	0.2910	*-2.90****

PANEL B
(Dependent variable BANKDEBT2)

	C1	C2	C3	C4	*T*
AQ_DD	0.4359	0.4544	0.4690	0.4687	*-5.47****
AQ_McN	0.4301	0.4578	0.4675	0.4720	*-6.87****
AQ_BS	0.4379	0.4553	0.4685	0.4663	*-4.70****
AQ_sdDD	0.4419	0.4622	0.4613	0.4634	*-3.44****
AQ_sdMcN	0.4399	0.4670	0.4613	0.4659	*-3.92****
AQ_sdBS	0.4427	0.4667	0.4600	0.4663	*-3.53****

5.2. Regression results

In table IV we present the results of the estimation of our model. Panel A provides the results obtained using BANKDEBT1 as dependent variable, and panel B those obtained using BANKDEBT2. For each panel we present results for the six proxies of accruals quality defined above (columns 1 to column 6). The regressions have been estimated using *t-statistics* based on standard errors clustered at the firm and the year level (Petersen, 2009), which are robust both to heteroskedasticity and within-firm serial correlation. The coefficients on accruals quality variables are positive and significant at 1% with both BANKDEBT1 and BANKDEBT2 as dependent variables, showing that those firms with higher accruals quality have more bank debt presence. This result confirms our hypothesis that higher accruals quality reduces information asymmetries between firms and banks and allows firms to obtain more bank debt. For the control variables, we obtain, in the model with BANKDEBT1 as dependent variable, that higher leverage, size, age and fixed assets are significantly associated to higher bank debt, whereas more profitable firms, with more growth opportunities and with higher Altman Z-score use less bank debt. These findings suggest that more indebted firms, firms with less information asymmetries (older and bigger) and with more collateral have more access to bank debt, which is consistent with the features of the Spanish market (De Andres et al., 2005); and also that the SME firms of our sample rely on internal resources when they are profitable for carrying out investment projects, whereas when they are not, they prefer to finance their projects with bank debt because it both reduces the probability of liquidation and because it is the main source of external funds in the Spanish market, a result which is consistent with the pecking order theory of Myers and Majluf (1984). In the model with BANKDEBT2 as dependent variable, the results are similar, except that the association of size with bank debt is weaker than in the model with BANKDEBT1 (10% or non-significant with some accruals quality proxies), and the coefficient on ROA is not significant.

Table IV
Bank debt and accruals quality (I)

BANKDEBT1 is calculated as total bank debt over total assets. BANKDEBT2 is defined as total bank debt over total debt. AQ_DD reports the negative value of the $|\hat{\varepsilon}_{it}|$ according to the Dechow and Dichev model, AQ_McN according to Dechow and Dichev model modified by McNichols (2002); and AQ_BS according to the Ball and Shivakumar model. AQ_sdDD, AQ_sdMcN, and AQ_sdBS, report the negative value of the standard deviation of firm i's residuals from the industry-year regressions, $\hat{\varepsilon}_{it}$, calculated over periods t-4 to t for Dechow and Dichev model, Dechow and Dichev model modified by McNichols (2002), and Ball and Shivakumar model, respectively. Growth opportunities (GROWP) are calculated as sales in year t over sales in year t-1; leverage (LEV) is defined as total debt over total assets; size (SIZE) is measured as the logarithm of assets; collateral (FA) is defined as fixed assets over total assets; return on assets (ROA) is earnings before interests and taxes over total assets; distance to bankruptcy (Z) is calculated using the Altman Z-score; and firm's age (LAGE) is defined as the logarithm of the number of years since the inception. ***, **, * denotes significance at the 1%, 5% and 10% level, respectively. t statistics in parentheses. The regressions have been estimated using *t-statistics* based on standard errors clustered at the firm and the year level (Petersen, 2009), which are robust both to heteroskedasticity and within-firm serial correlation.

PANEL A
(Dependent variable BANKDEBT1)

	(1)	(2)	(3)	(4)	(5)	(6)
AQ_DD	0.1815***					
	(3.22)					
AQ_McN		0.3016***				
		(4.53)				
AQ_BS			0.1660***			
			(2.89)			
AQ_sdDD				0.2828***		
				(2.49)		
AQ_sdMcN					0.4605***	
					(3.63)	
AQ_sdBS						0.2943***
						(2.41)
GROWP	-0.0203***	-0.0208**	-0.0205***	-0.0208**	-0.0336***	-0.0283***
	(-2.85)	(-2.45)	(-2.86)	(-2.56)	(-3.23)	(-3.11)
LEV	0.5579***	0.5578***	0.5579***	0.5597***	0.5612***	0.5539***
	(22.25)	(22.48)	(22.26)	(21.85)	(22.37)	(21.74)
SIZE	0.0155***	0.0151***	0.0156***	0.0157***	0.0142***	0.0141***
	(3.71)	(3.71)	(3.72)	(3.74)	(3.62)	(3.59)
FA	0.1477***	0.1483***	0.1477***	0.1461***	0.1428***	0.1387***
	(8.47)	(8.54)	(8.48)	(8.42)	(8.41)	(8.30)
ROA	-0.0557*	-0.0575*	-0.0555*	-0.0537	-0.0520	-0.0546
	(-1.66)	(-1.65)	(-1.65)	(-1.58)	(-1.44)	(-1.54)
Z	-0.0242***	-0.0240***	-0.0243***	-0.0243***	-0.0238***	-0.0249***
	(-5.33)	(-5.34)	(-5.34)	(-5.16)	(-5.17)	(-5.28)
LAGE	0.0093**	0.0091**	0.0093**	0.0094**	0.0092**	0.0085**
	(2.28)	(2.24)	(2.29)	(2.23)	(2.17)	(2.02)
Intercept	-0.1732***	-0.1678***	-0.1740***	-0.1743***	-0.1420***	-0.1430***
	(-2.95)	(-2.92)	(-2.97)	(-2.93)	(-2.79)	(-2.60)
R-squared	0.6095	0.6120	0.6093	0.6091	0.6141	0.6099

Table IV continued

PANEL B

(Dependent variable BANKDEBT2)

	(1)	(2)	(3)	(4)	(5)	(6)
AQ_DD	0.3875***					
	(4.1)					
AQ_McN		0.5633***				
		(4.83)				
AQ_BS			0.3530***			
			(3.77)			
AQ_sdDD				0.5577***		
				(2.91)		
AQ_sdMcN					0.8507***	
					(3.87)	
AQ_sdBS						0.6068***
						(2.81)
GROWP	-0.0254***	-0.0262***	-0.0259***	-0.0261**	-0.0400**	-0.0328**
	(-2.58)	(4.83)	(-2.61)	(-2.27)	(-2.23)	(-1.94)
LEV	0.1616***	0.1612***	0.1617***	0.1657***	0.1577***	0.1481***
	(3.63)	(3.65)	(3.63)	(3.67)	(3.7)	(3.41)
SIZE	0.0130*	0.0124*	0.0131*	0.0133*	0.0102	0.1025
	(1.83)	(1.79)	(1.84)	(1.88)	(1.6)	(1.58)
FA	0.2118***	0.2131***	0.2118***	0.2105***	0.1995***	0.1936***
	(7.25)	(7.35)	(7.25)	(7.07)	(7.22)	(7.04)
ROA	-0.0564	-0.0583	-0.0560	-0.0551	-0.0385	-0.0482
	(-0.92)	(-0.89)	(-0.91)	(-0.87)	(-0.6)	(-0.76)
Z	-0.0619***	-0.0619***	-0.0620***	-0.0616***	-0.0638***	-0.0646***
	(-7.42)	(-7.43)	(-7.42)	(-7.18)	(-7.82)	(-7.7)
LAGE	0.0184***	0.0182***	0.0185***	0.0186***	0.0177***	0.0166**
	(2.82)	(2.8)	(2.84)	(2.73)	(2.6)	(2.45)
Intercept	0.3178***	0.3264***	0.3159***	0.3145***	0.3856***	0.3766***
	(2.99)	(3.12)	(2.98)	(2.89)	(4.35)	(3.88)
R-squared	0.3137	0.3177	0.3130	0.3130	0.3139	0.3091

In table V we estimate the same regressions than in table IV with firm fixed effects in order to control for unobservable firm heterogeneity, and the results for the accruals quality proxies are similar to those in table IV. For the control variables, the findings are also similar, except in the model with BANKDEBT1, for the coefficients on Altman Z-score and LAGE, which are not significant when we estimate with firm fixed effects. The differences in model with BANKDEBT2 with respect to the estimation in levels are that the coefficient on ROA is significantly negative (whereas it was not significant in levels) and the coefficient on LAGE, which was significant in levels, is not significant with fixed effects.

Table V
Bank debt and accruals quality (II)

BANKDEBT1 is calculated as total bank debt over total assets. BANKDEBT2 is defined as total bank debt over total debt. AQ_DD reports the negative value of the $|\hat{\varepsilon}_{it}|$ according to the Dechow and Dichev model, AQ_McN according to Dechow and Dichev model modified by McNichols (2002); and AQ_BS according to the Ball and Shivakumar model. AQ_sdDD, AQ_sdMcN, and AQ_sdBS, report the negative value of the standard deviation of firm i's residuals from the industry-year regressions, $\hat{\varepsilon}_{it}$, calculated over periods t-4 to t for Dechow and Dichev model, Dechow and Dichev model modified by McNichols (2002), and Ball and Shivakumar model, respectively. Growth opportunities (GROWP) are calculated as sales in year t over sales in year t-1; leverage (LEV) is defined as total debt over total assets; size (SIZE) is measured as the logarithm of assets; collateral (FA) is defined as fixed assets over total assets; return on assets (ROA) is earnings before interests and taxes over total assets; distance to bankruptcy (Z) is calculated using the Altman Z-score; and firm's age (LAGE) is defined as the logarithm of the number of years since the inception. ***, **, * denotes significance at the 1%, 5% and 10% level, respectively. t statistics in parentheses. The regressions have been carried out using the fixed effects estimator.

PANEL A
(Dependent variable BANKDEBT1)

	(1)	(2)	(3)	(4)	(5)	(6)
AQ_DD	0.1288***					
	(4.9)					
AQ_McN		0.1756***				
		(6.21)				
AQ_BS			0.1260***			
			(4.75)			
AQ_sdDD				0.1164**		
				(2.19)		
AQ_sdMcN					0.2327***	
					(3.72)	
AQ_sdBS						0.1879***
						(3.11)
GROWP	-0.0189***	-0.0189***	-0.0189***	-0.0199***	-0.0385***	-0.0319***
	(-6.24)	(-6.22)	(-6.26)	(-6.36)	(-9.69)	(-8.07)
LEV	0.6770***	0.6890***	0.6766***	0.6811***	0.7252***	0.6969***
	(37.42)	(37.85)	(37.4)	(36.65)	(36.16)	(33.72)
SIZE	0.0514***	0.0506***	0.0514***	0.0524***	0.0488***	0.0500***
	(11.34)	(11.14)	(11.34)	(11.26)	(9.49)	(9.52)
FA	0.1736***	0.1810***	0.1734***	0.1752***	0.1697***	0.1646***
	(14.85)	(15.49)	(14.83)	(14.64)	(13.24)	(12.61)
ROA	-0.2037***	-0.2093***	-0.2035***	-0.1997***	-0.1974***	-0.1813***
	(-9.77)	(-10.04)	(-9.75)	(-9.36)	(-8.78)	(-7.77)
Z	0.0045	0.0055*	0.0045	0.0050*	0.0096***	0.0060*
	(1.58)	(1.93)	(1.57)	(1.72)	(3.12)	(1.88)
LAGE	-0.0093	-0.0089	-0.0094	-0.0046	-0.0022	-0.0112
	(-0.77)	(-0.73)	(-0.78)	(-0.34)	(-0.14)	(-0.69)
Intercept	-0.5918***	-0.5970***	-0.5916***	-0.6202***	-0.6194***	-0.5749***
	(-10.34)	(-10.37)	(-10.34)	(-10.25)	(-9.12)	(-8.22)
R-squared	0.4393	0.4467	0.4392	0.4380	0.4448	0.4303

Table V continued

PANEL B

(Dependent variable BANKDEBT2)

	(1)	(2)	(3)	(4)	(5)	(6)
AQ_DD	0.2494***					
	(5.82)					
AQ_McN		0.3078***				
		(6.67)				
AQ_BS			0.2382***			
			(5.51)			
AQ_sdDD				0.2277***		
				(2.62)		
AQ_sdMcN					0.4938***	
					(4.78)	
AQ_sdBS						0.4082***
						(4.11)
GROWP	-0.0215***	-0.0217***	-0.0216***	-0.0225***	-0.0478***	-0.0390***
	(-4.35)	(-4.38)	(-4.39)	(-4.4)	(-7.29)	(-6)
LEV	0.3077***	0.3262***	0.3069***	0.3110***	0.3590***	0.3254***
	(10.44)	(10.98)	(10.41)	(10.24)	(10.86)	(9.67)
SIZE	0.0482***	0.0475***	0.0483***	0.0483***	0.0373***	0.0379***
	(6.53)	(6.4)	(6.55)	(6.35)	(4.4)	(4.38)
FA	0.2536***	0.2657***	0.2532***	0.2588***	0.2514***	0.2378***
	(13.32)	(13.93)	(13.29)	(13.23)	(11.89)	(11.09)
ROA	-0.1484***	-0.1540***	-0.1476***	-0.1385***	-0.0982***	-0.0791**
	(-4.37)	(-4.53)	(-4.34)	(-3.97)	(-2.65)	(-2.06)
Z	-0.0345***	-0.0330***	-0.0345***	-0.0344***	-0.0327***	-0.0372***
	(-7.42)	(-7.09)	(-7.43)	(-7.24)	(-6.46)	(-7.07)
LAGE	0.0123	0.0114	0.0121	0.0220	0.0187	0.0128
	(0.62)	(0.57)	(0.61)	(0.99)	(0.72)	(0.48)
Intercept	-0.1628	-0.1710*	-0.1629*	-0.1992**	-0.0986	-0.0574
	(0.09)	(-1.82)	(-1.75)	(-2.01)	(-0.88)	(-0.5)
R-squared	0.2195	0.2269	0.2191	0.2169	0.2200	0.2095

Dechow and Dichev (2002) distinguish between innate factors that determine the value of accruals quality, such as the firm's business model and its operating environment, and discretionary factors associated to reporting decisions of managers. This identification of determinants of accruals quality is then used by Francis et al. (2004) to analyze the different effect of innate accruals quality and discretionary accruals quality on the cost of capital. Accordingly, in tables VI and VII we include as control variables these innate determinants of accruals identified by Dechow and Dichev (2002) as control variables: operating cycle (OPERCYCLE), firm size (SIZE), standard deviation of sales (σ(SALES)), standard deviation of cash from operations (σ(CFO)), and percentage of years in which earnings are negative (NEGEARN). In these estimations, we interpret coefficients of accruals quality metrics as a measure of the effect of the discretionary portion of each accruals quality metric on bank debt. The estimation in table VI is run with standard errors clustered at firm and year level, whereas in table VII we estimate with firm fixed effects. The coefficients for all accruals quality proxies are positive and significant, so these results confirm that higher discretionary accruals quality is associated to higher bank debt.

Table VI
Bank debt and accruals quality (III)

BANKDEBT1 is calculated as total bank debt over total assets. BANKDEBT2 is defined as total bank debt over total debt. AQ_DD reports the negative value of the $|\hat{\varepsilon}_{it}|$ according to the Dechow and Dichev model, AQ_McN according to Dechow and Dichev model modified by McNichols (2002); and AQ_BS according to the Ball and Shivakumar model. AQ_sdDD, AQ_sdMcN, and AQ_sdBS, report the negative value of the standard deviation of firm i's residuals from the industry-year regressions, $\hat{\varepsilon}_{it}$, calculated over periods t-4 to t for Dechow and Dichev model, Dechow and Dichev model modified by McNichols (2002), and Ball and Shivakumar model, respectively. Growth opportunities (GROWP) are calculated as sales in year t over sales in year t-1; leverage (LEV) is defined as total debt over total assets; size (SIZE) is measured as the logarithm of assets; collateral (FA) is defined as fixed assets over total assets; return on assets (ROA) is earnings before interests and taxes over total assets; distance to bankruptcy (Z) is calculated using the Altman Z-score; and firm's age (LAGE) is defined as the logarithm of the number of years since the inception; OPERCYCLE is the length of the operating cycle; σ(SALES) the standard deviation of Sales; σ(CFO) is the standard deviation of CFO; and NEGEARN the percentage of years in which earnings are negative. ***, **, * denotes significance at the 1%, 5% and 10% level, respectively. t statistics in parentheses. The regressions have been estimated using *t-statistics* based on standard errors clustered at the firm and the year level (Petersen, 2009), which are robust both to heteroskedasticity and within-firm serial correlation.

PANEL A
(Dependent variable BANKDEBT1)

	(1)	(2)	(3)	(4)	(5)	(6)
AQ_DD	0.1646***					
	(3.24)					
AQ_McN		0.2916***				
		(4.77)				
AQ_BS			0.1453***			
			(2.72)			
AQ_sdDD				0.2697**		
				(2.45)		
AQ_sdMcN					0.4796***	
					(4.04)	
AQ_sdBS						0.2783**
						(2.39)
GROWP	-0.0096	-0.0103	-0.0098	-0.0106***	-0.0202**	-0.0152*
	(-1.58)	(-1.44)	(-1.60)	(2.45)	(-2.00)	(-1.69)
LEV	0.6618***	0.6602***	0.6621***	-0.0106	0.6598***	0.6580***
	(23.53)	(23.50)	(23.57)	(-1.54)	(23.70)	(22.56)
SIZE	0.0123***	0.0120***	0.0123***	0.6627***	0.0113***	0.0108***
	(2.94)	(2.94)	(2.95)	(23.16)	(2.83)	(2.77)
FA	0.2128***	0.2127***	0.2128***	0.2123***	0.2062***	0.2042***
	(10.63)	(10.59)	(10.65)	(10.54)	(10.68)	(10.46)
ROA	-0.1121***	-0.1085***	-0.1127***	-0.1103***	0.0991***	-0.1083***
	(-3.36)	(-3.02)	(-3.37)	(-3.32)	(-2.75)	(-3.11)
Z	-0.0050	-0.0050	-0.0051	-0.0050	-0.0054	-0.0057
	(-1.00)	(-0.10)	(-1.01)	(-0.97)	(-1.06)	(-1.07)
LAGE	0.0060	0.0058	0.0061	0.0059	0.0058	0.0051
	(1.53)	(1.48)	(1.54)	(1.46)	(1.40)	(1.25)
OPERCYCLE	0.0002***	0.0002***	0.0002***	0.0002***	0.0002***	0.0002***
	(7.06)	(6.91)	(7.07)	(6.98)	(6.83)	(6.43)
σ(SALES)	-0.0385*	-0.0366*	-0.0391*	-0.0351*	-0.0292	-0.0333
	(-1.88)	(-1.76)	(-1.90)	(-1.68)	(-1.35)	(-1.54)
σ(CFO)	0.0132	0.0189	0.0109	0.0350	0.0380	0.0173
	(0.32)	(0.45)	(0.27)	(0.78)	(0.83)	(0.38)

Table VI continued

NEGEARN	-0.0173*	-0.0141	-0.0178**	-0.0177*	-0.0129	-0.0165*
	(-1.90)	(-1.53)	(-1.96)	(-1.90)	(-1.35)	(-1.68)
Intercept	-0.3065***	-0.3020***	-0.3069***	-0.3091***	-0.2745***	-0.2800***
	(-4.99)	(-4.97)	(-5.00)	(-4.98)	(-4.99)	(-4.64)
R-squared	0.6242	0.6267	0.6240	0.6239	0.6284	0.6249

PANEL B
(Dependent variable BANKDEBT2)

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
AQ_DD	0.3475***					
	(4.31)					
AQ_McN		0.5277***				
		(5.23)				
AQ_BS			0.3070***			
			(3.72)			
AQ_sdDD				0.5275***		
				(2.82)		
AQ_sdMcN					0.8590***	
					(4.15)	
AQ_sdBS						0.5688***
						(2.76)
GROWP	-0.0112	-0.0123	-0.0116	-0.0123	-0.0220	-0.0149
	(-1.21)	(-1.18)	(-1.24)	(-1.18)	(-1.27)	(-0.91)
LEV	0.2913***	0.2892***	0.2919***	0.2943***	0.2794***	0.2781***
	(6.18)	(6.11)	(6.2)	(6.15)	(6.52)	(6.1)
SIZE	0.0082	0.0077	0.0082	0.0085	0.0058	0.0054
	(1.16)	(1.12)	(1.16)	(1.22)	(0.9)	(0.84)
FA	0.2971***	0.2974***	0.2971***	0.2982***	0.2830***	0.2804***
	(9.13)	(9.14)	(9.14)	(8.91)	(9.38)	(8.98)
ROA	-0.1513**	-0.1467**	-0.1526**	-0.1512**	-0.1227	-0.1405**
	(-2.35)	(-2.1)	(-2.37)	(-2.28)	(-1.83)	(-2.19)
Z	-0.0387***	-0.0388***	-0.0387***	-0.0383***	-0.0417***	-0.0414***
	(-4.25)	(-4.22)	(-4.25)	(-4.13)	(-4.98)	(-4.61)
LAGE	0.0145**	0.0144**	0.0146**	0.0145**	0.0137**	0.0126*
	(2.26)	(2.23)	(2.27)	(2.16)	(2.02)	(1.87)
OPERCYCLE	0.0002***	0.0002***	0.0002***	0.0002***	0.0002***	0.0002***
	(6.52)	(6.31)	(6.51)	(6.73)	(6.63)	(6.34)
σ(SALES)	-0.0300	-0.0284	-0.0310	-0.0219	-0.0108	-0.0184
	(-0.97)	(-0.9)	(-1)	(-0.69)	(-0.33)	(-0.58)
σ(CFO)	0.0016	0.0073	-0.0031	0.0358	0.0326	0.0067
	(0.02)	(0.11)	(-0.05)	(0.53)	(0.48)	(0.1)
NEGEARN	-0.0434***	-0.0395***	-0.0445***	-0.0449***	-0.0399***	-0.0437***
	(-3.4)	(-3.01)	(-3.48)	(-3.53)	(-3.01)	(-3.22)
Intercept	0.1579	0.1651	0.1569	0.1507	0.2267**	0.2097**
	(1.43)	(1.5)	(1.42)	(1.34)	(2.44)	(2.03)
R-squared	0.3311	0.3348	0.3305	0.3310	0.3340	0.3273

Table VII
Bank debt and accruals quality (IV)

BANKDEBT1 is calculated as total bank debt over total assets. BANKDEBT2 is defined as total bank debt over total debt. AQ_DD reports the negative value of the $|\hat{\varepsilon}_{it}|$ according to the Dechow and Dichev model, AQ_McN according to Dechow and Dichev model modified by McNichols (2002); and AQ_BS according to the Ball and Shivakumar model. AQ_sdDD, AQ_sdMcN, and AQ_sdBS, report the negative value of the standard deviation of firm i's residuals from the industry-year regressions, $\hat{\varepsilon}_{it}$, calculated over periods t-4 to t for Dechow and Dichev model, Dechow and Dichev model modified by McNichols (2002), and Ball and Shivakumar model, respectively. Growth opportunities (GROWP) are calculated as sales in year t over sales in year t-1; leverage (LEV) is defined as total debt over total assets; size (SIZE) is measured as the logarithm of assets; collateral (FA) is defined as fixed assets over total assets; return on assets (ROA) is earnings before interests and taxes over total assets; distance to bankruptcy (Z) is calculated using the Altman Z-score; and firm's age (LAGE) is defined as the logarithm of the number of years since the inception; OPERCYCLE is the length of the operating cycle; σ(SALES) the standard deviation of Sales; σ(CFO) is the standard deviation of CFO; and NEGEARN the percentage of years in which earnings are negative. ***, **, * denotes significance at the 1%, 5% and 10% level, respectively. t statistics in parentheses. The regressions have been carried out using the fixed effects estimator.

PANEL A (Dependent variable BANKDEBT1)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
AQ_DD	0.1377***					
	(5.22)					
AQ_McN		0.1801***				
		(6.35)				
AQ_BS			0.1344***			
			(5.05)			
AQ_sdDD				0.1603***		
				(2.97)		
AQ_sdMcN					0.2643***	
					(4.18)	
AQ_sdBS						0.2258***
						(3.70)
GROWP	-0.0154***	-0.0153***	-0.0155***	-0.0163***	-0.0339***	-0.0274***
	(-5.02)	(-4.98)	(-5.04)	(-5.16)	(-8.35)	(-6.76)
LEV	0.6941***	0.7046***	0.6937***	0.7009***	0.7345***	0.7099***
	(37.99)	(38.4)	(37.96)	(37.37)	(36.38)	(34.08)
SIZE	0.0519***	0.0513***	0.0519***	0.0528***	0.0497***	0.0503***
	(11.32)	(11.17)	(11.33)	(11.21)	(9.51)	(9.41)
FA	0.1867***	0.1945***	0.1865***	0.1885***	0.1804***	0.1750***
	(15.74)	(16.41)	(15.72)	(15.56)	(13.88)	(13.23)
ROA	-0.1953***	-0.1991***	-0.1951***	-0.1943***	-0.1907***	-0.1777***
	(-9.32)	(-9.5)	(-9.3)	(-9.06)	(-8.43)	(-7.58)
Z	0.0097***	0.0107***	0.0097***	0.0106***	0.0133***	0.0103***
	(3.36)	(3.69)	(3.34)	(3.58)	(4.28)	(3.17)
LAGE	-0.0023	-0.0017	-0.0024	0.0010	0.0022	-0.0055
	(-0.19)	(-0.14)	(-0.2)	(0.07)	(0.14)	(-0.34)
OPERCYCLE	0.0001***	0.0001***	0.0001***	0.0001***	0.0001***	0.0001***
	(7.92)	(8.13)	(7.92)	(8.25)	(6.2)	(6.4)
σ(SALES)	0.0178**	0.0203***	0.0178**	0.0184**	0.0155*	0.0180**
	(2.37)	(2.69)	(2.37)	(2.34)	(1.89)	(2.13)
σ(CFO)	0.0109	0.0147	0.0097	0.0159	0.0291	0.0292
	(0.6)	(0.81)	(0.54)	(0.84)	(1.43)	(1.41)
NEGEARN	0.0157*	0.0170***	0.0156***	0.0146***	0.0140***	0.0124**
	(1.84)	(3.32)	(3.04)	(2.8)	(2.53)	(2.17)
Intercept	-0.6742***	-0.6828***	-0.6736***	-0.7006***	-0.6871***	-0.6444***
	(-11.67)	(-11.75)	(-11.66)	(-11.48)	(-10.03)	(-9.13)
R-squared	0.4460	0.4540	0.4459	0.4452	0.4499	0.4360

Table VII continued

PANEL B
(Dependent variable BANKDEBT2)

	(1)	(2)	(3)	(4)	(5)	(6)
AQ_DD	0.2531***					
	(5.87)					
AQ_McN		0.3047***				
		(6.57)				
AQ_BS			0.2411***			
			(5.55)			
AQ_sdDD				0.2615***		
				(2.96)		
AQ_sdMcN					0.5119***	
					(4.9)	
AQ_sdBS						0.4367***
						(4.35)
GROWP	-0.0161***	-0.0162***	-0.0163***	-0.0167***	-0.0404***	-0.0317***
	(-3.22)	(-3.22)	(-3.25)	(-3.24)	(-6.01)	(-4.75)
LEV	0.3341***	0.3509***	0.3334***	0.3425***	0.3761***	0.3494***
	(11.2)	(11.69)	(11.17)	(11.15)	(11.28)	(10.19)
SIZE	0.0468***	0.0463***	0.0469***	0.0463***	0.0354***	0.0353***
	(6.26)	(6.16)	(6.26)	(6)	(4.1)	(4.02)
FA	0.2728***	0.2855***	0.2724***	0.2791***	0.2668***	0.2527***
	(14.08)	(14.72)	(14.06)	(14.06)	(12.43)	(11.61)
ROA	-0.1449***	-0.1485***	-0.1442***	-0.1403***	-0.0983***	-0.0819**
	(-4.23)	(-4.33)	(-4.21)	(-4)	(-2.63)	(-2.12)
Z	-0.0278***	-0.0264***	-0.0279***	-0.0272***	-0.0281***	-0.0319***
	(-5.87)	(-5.57)	(-5.88)	(-5.6)	(-5.46)	(-5.95)
LAGE	0.0212	0.0206	0.0210	0.0286	0.0247	0.0204
	(1.08)	(1.03)	(1.06)	(1.29)	(0.94)	(0.76)
OPERCYCLE	0.0001***	0.0001***	0.0001***	0.0001***	0.0000***	0.0001***
	(6.59)	(6.75)	(6.6)	(7.04)	(5.28)	(5.4)
σ(SALES)	0.0215*	0.0237*	0.0214*	0.0216*	0.0216	0.0238*
	(1.76)	(1.91)	(1.75)	(1.68)	(1.59)	(1.72)
σ(CFO)	0.0047	0.0108	0.0024	0.0089	0.0285	0.0317
	(0.16)	(0.36)	(0.08)	(0.29)	(0.85)	(0.93)
NEGEARN	0.0070	0.0083	0.0067	0.0034	0.0018	0.0009
	(0.84)	(0.99)	(0.8)	(0.4)	(0.19)	(0.09)
Intercept	-0.2525***	-0.2646***	-0.2518***	-0.2831***	-0.1632***	-0.1256
	(-2.68)	(-2.78)	(-2.67)	(-2.83)	(-1.44)	(-1.08)
R-squared	0.2250	0.2328	0.2246	0.2232	0.2243	0.2143

5.3 Robustness results: Endogeneity and collinearity between leverage and Altman Z-score

In this section we consider the potential endogeneity between bank debt and accruals quality since there are theoretical arguments to expect that leverage, and in particular bank debt, which is the main source of debt in the Spanish market, may also influence accruals quality.

On the one hand, in high-leveraged firms, managers have incentives to manipulate earnings to avoid debt covenants violations (Watts and Zimmerman, 1986), so a negative effect of debt on accruals quality is expected. Although the debt covenant hypothesis is the traditional argument for the effect of debt on the manipulation of earnings, Feltham, Robb and Zhang (2007) develop a model that predicts that when the firm performance is average to good, and since debt holders demand high quality information, managers will use their accounting discretion to provide more precise information in order to obtain better contracting terms, such as interest costs. Accordingly, we address this possible endogeneity of bank debt using a two-stage least-squares model (2SLS). We model bank debt and accruals quality as simultaneously determined. Accruals quality is estimated endogenously in the first stage regression and bank debt is the dependent variable in the second-stage regression. In the first stage, we estimate accruals quality according to the model[2]:

$$AQ_{it}=Intercept+\delta_1 BANKDEBT_{it}+\delta_2 SIZE_{it}+\delta_3 OPERCYCLE_{it}+\delta_4\sigma(SALES)_{it}+\delta_5\sigma(CFO)_{it}+\delta_6 NEGEARN_{it}+\delta_7 FCOST_{it}+\delta_8 Altman\text{-}Z_{it}+\eta_i+\lambda_t+\varepsilon_{it} \quad (5)$$

All these variables have been defined previously, except FCOST, which is calculated as the ratio of financial expenses over total debt minus accounts payable.
In the second stage, we use the predicted value of accruals quality from the first stage regression. In Table VIII, we show the 2SLS results, which are consistent with our main findings, i.e., accruals quality metrics are positively and significantly related to bank debt.

As previously noted, there is high correlation between leverage and Altman Z-score (0.75). To address this issue, and to avoid a possible specification error if we remove the control for one of these variables, we regress the Altman Z-score on leverage and introduce the residuals from this regression, denoted by R_Z*,* instead of the Altman Z-score. Doing this renders the information of leverage orthogonal to Altman Z-score, and residuals capture the portion of Altman Z-score that is not explained by leverage. Table IX reports regression results for the new models (including R_Z instead of Altman-Z). Once again the conclusions are the same as those presented before.

[2] Following Ghosh and Moon (2010), we also consider a possible non-linear association of bank debt with accruals quality, introducing the square term for bank debt in the first state (not reported), and the results remain unchanged in the second stage.

Table VIII
Bank debt and accruals quality: two stage regressions

We address the possible endogeneity of bank debt using a two-stage least-squares model (2SLS). Accruals quality is estimated endogenously in the first stage regression and bank debt is the dependent variable in the second-stage regression. In the first stage, we estimate accruals quality according to equation (5). In the second stage, we use the predicted value of accruals quality *(predict_AQ)* from the first stage regression. BANKDEBT1 is calculated as total bank debt over total assets; BANKDEBT2 is defined as total bank debt over total debt; Growth opportunities (GROWP) are calculated as sales in year t over sales in year t-1; leverage (LEV) is defined as total debt over total assets; size (SIZE) is measured as the logarithm of assets; collateral (FA) is defined as fixed assets over total assets; return on assets (ROA) is earnings before interests and taxes over total assets; distance to bankruptcy (Z) is calculated using the Altman Z-score; and firm's age (LAGE) is defined as the logarithm of the number of years since the inception. ***, **, * denotes significance at the 1%, 5% and 10% level, respectively. t statistics in parentheses. The regressions have been estimated using the fixed effects estimator.

PANEL A
(Dependent variable BANKDEBT1)

	(1)	(2)	(3)	(4)	(5)	(6)
***predict*_AQ_DD**	4.3984***					
	(26.76)					
***predict*_AQ_McN**		5.7090***				
		(32.95)				
***predict*_AQ_BS**			4.6762***			
			(27.4)			
***predict*_AQ_sdDD**				2.5533***		
				(10.22)		
***predict*_AQ_sdMcN**					6.3015***	
					(20.5)	
***predict*_AQ_sdBS**						4.9617***
						(18.38)
GROWP	-0.0100***	-0.0059**	-0.0098***	-0.0176***	-0.0143***	-0.0157***
	(-3.45)	(-2.06)	(-3.38)	(-5.84)	(-4.86)	(-5.3)
LEV	0.6356***	0.6303***	0.6294***	0.6695***	0.6561***	0.6454***
	(36.69)	(37.27)	(36.38)	(37.2)	(37.23)	(36.31)
SIZE	0.0093**	-0.0014	0.0070	0.0626***	0.0809***	0.0749***
	(2.01)	(-0.32)	(1.51)	(13.57)	(17.5)	(16.29)
FA	0.1794***	0.1854***	0.1780***	0.1759***	0.1749***	0.1690***
	(16.08)	(17.01)	(15.99)	(15.13)	(15.37)	(14.77)
ROA	-0.2269	-0.2282***	-0.2271***	-0.2100***	-0.2254***	-0.2230***
	(-11.41)	(-11.75)	(-11.44)	(-10.13)	(-11.1)	(-10.92)
Altman-Z	-0.0082***	-0.0109***	-0.0087***	0.0030	-0.0008	0.0000
	(-2.97)	(-4.03)	(-3.16)	(1.06)	(-0.29)	(-0.01)
LAGE	-0.0201*	-0.0176*	-0.0205*	-0.0148	-0.0153	-0.0161
	(-1.74)	(-1.57)	(-1.78)	(-1.23)	(-1.3)	(-1.36)
Intercept	0.0090	0.1336**	0.0440	-0.5988***	-0.6521***	-0.6191***
	(0.15)	(2.31)	(0.74)	(-10.54)	(-11.72)	(-11.07)
R-squared	0.4898	0.5132	0.4921	0.4457	0.4694	0.4634

Table VIII continued

PANEL B

(Dependent variable BANKDEBT2)

	(1)	(2)	(3)	(4)	(5)	(6)
***predict*_AQ_DD**	9.7953***					
	(40.87)					
***predict*_AQ_McN**		11.7397***				
		(46.47)				
***predict*_AQ_BS**			10.1352***			
			(40.39)			
***predict*_AQ_sdDD**				5.0230***		
				(12.35)		
***predict*_AQ_sdMcN**					11.8358***	
					(23.82)	
***predict*_AQ_sdBS**						8.9166***
						(20.36)
GROWP	-0.0025	0.0040	-0.0028	-0.0193***	-0.0139***	-0.0168***
	(-0.57)	(0.91)	(-0.63)	(-3.94)	(-2.93)	(-3.51)
LEV	0.3121***	0.3327***	0.3078***	0.3131***	0.3223***	0.3037***
	(11.76)	(12.89)	(11.58)	(10.71)	(11.34)	(10.58)
SIZE	-0.0412***	-0.0547***	-0.0434***	0.0712***	0.1051***	0.0920***
	(-5.89)	(-7.99)	(-6.15)	(9.48)	(14.05)	(12.31)
FA	0.2514***	0.2627***	0.2495***	0.2583***	0.2556***	0.2462***
	(14.66)	(15.75)	(14.52)	(13.67)	(13.92)	(13.27)
ROA	-0.2192***	-0.2222***	-0.2197***	-0.1654***	-0.2004***	-0.1940***
	(-7.16)	(-7.46)	(-7.16)	(-4.91)	(-6.11)	(-5.85)
Altman-Z	-0.0529***	-0.0535***	-0.0524***	-0.0352***	-0.0388***	-0.0369***
	(-12.56)	(-13.08)	(-12.42)	(-7.64)	(-8.65)	(-8.16)
LAGE	-0.0165	-0.0104	-0.0167	0.0008	-0.0008	-0.0016
	(-0.93)	(-0.6)	(-0.94)	(0.04)	(-0.04)	(-0.08)
Intercept	1.0755***	1.1967***	1.1061***	-0.1995***	-0.3295***	-0.2662***
	(12.04)	(13.79)	(12.3)	(-2.16)	(-3.66)	(-2.93)
R-squared	0.3673	0.4012	0.3644	0.2325	0.2747	0.2597

Table IX

Bank debt and accruals quality: collinearity between Leverage and Altman Z

BANKDEBT1 is calculated as total bank debt over total assets; BANKDEBT2 is defined as total bank debt over total debt; AQ_DD reports the negative value of the $|\hat{\varepsilon}_{it}|$ according to the Dechow and Dichev model, AQ_McN according to Dechow and Dichev model modified by McNichols (2002), and AQ_BS according to the Ball and Shivakumar model; AQ_sdDD, AQ_sdMcN, and AQ_sdBS, report the negative value of the standard deviation of firm i's residuals from the industry-year regressions, $\hat{\varepsilon}_{it}$, calculated over periods t-4 to t for Dechow and Dichev model, Dechow and Dichev model modified by McNichols (2002), and Ball and Shivakumar model, respectively; Growth opportunities Growth opportunities (GROWP) are calculated as sales in year t over sales in year t-1; leverage (LEV) is defined as total debt over total assets; size (SIZE) is measured as the logarithm of assets; collateral (FA) is defined as fixed assets over total assets; return on assets (ROA) is earnings before interests and taxes over total assets; distance to bankruptcy (R_Z) is calculated as the residuals obtained from regressing the Altman Z-score on leverage, and firm's age (LAGE) is defined as the logarithm of the number of years since the inception. ***, **, * denotes significance at the 1%, 5% and 10% level, respectively. t statistics in parentheses. The regressions have been estimated using the fixed effects estimator.

PANEL A
(Dependent variable BANKDEBT1)

	(1)	(2)	(3)	(4)	(5)	(6)
AQ_DD	0.1288***					
	(4.9)					
AQ_McN		0.1756***				
		(6.21)				
AQ_BS			0.1260***			
			(4.75)			
AQ_sdDD				0.1164***		
				(2.19)		
AQ_sdMcN					0.2327***	
					(3.72)	
AQ_sdBS						0.1879***
						(3.11)
GROWP	-0.0189***	-0.0189***	-0.0189***	-0.0199***	-0.0385***	-0.0319***
	(-6.24)	(-6.22)	(-6.26)	(-6.36)	(-9.69)	(-8.07)
LEV	0.6555***	0.6627***	0.6552***	0.6572***	0.6795***	0.6681***
	(55.86)	(56.29)	(55.84)	(54.57)	(52.06)	(49.68)
SIZE	0.0514***	0.0506***	0.0514***	0.0524***	0.0488***	0.0500***
	(11.34)	(11.14)	(11.34)	(11.26)	(9.49)	(9.52)
FA	0.1736***	0.1810***	0.1734***	0.1752***	0.1697***	0.1646***
	(14.85)	(15.49)	(14.83)	(14.64)	(13.24)	(12.61)
ROA	-0.2037***	-0.2093***	-0.2035***	-0.1997***	-0.1974***	-0.1813***
	(-9.77)	(-10.04)	(-9.75)	(-9.36)	(-8.78)	(-7.77)
R_Z	0.0045*	0.0055*	0.0045	0.0050*	0.0096***	0.0060*
	(1.58)	(1.93)	(1.57)	(1.72)	(3.12)	(1.88)
LAGE	-0.0093	-0.0089	-0.0094	-0.0046	-0.0022	-0.0112
	(-0.77)	(-0.73)	(-0.78)	(-0.34)	(-0.14)	(-0.69)
Intercept	-0.5668***	-0.5664***	-0.5667***	-0.5924***	-0.5663***	-0.5415***
	(-11.01)	(-10.92)	(-11)	(-10.76)	(-9.06)	(-8.42)
R-squared	0.4393	0.4467	0.4392	0.4380	0.4448	0.4303

Table IX continued

PANEL B

(Dependent variable BANKDEBT2)

	(1)	(2)	(3)	(4)	(5)	(6)
AQ_DD	0.2494***					
	(5.82)					
AQ_McN		0.3078***				
		(6.67)				
AQ_BS			0.2382***			
			(5.51)			
AQ_sdDD				0.2277***		
				(2.62)		
AQ_sdMcN					0.4938***	
					(4.78)	
AQ_sdBS						0.4082***
						(4.11)
GROWP	-0.0215***	-0.0217***	-0.0216***	-0.0225***	-0.0478***	-0.0390***
	(-4.35)	(-4.38)	(-4.39)	(-4.4)	(-7.29)	(-6)
LEV	0.4725***	0.4840***	0.4720***	0.4756***	0.5153***	0.5063***
	(24.72)	(25.19)	(24.69)	(24.17)	(23.94)	(22.92)
SIZE	0.0482***	0.0475***	0.0483***	0.0483***	0.0373***	0.0379***
	(6.53)	(6.4)	(6.55)	(6.35)	(4.4)	(4.38)
FA	0.2536***	0.2657***	0.2532***	0.2588***	0.2514***	0.2378***
	(13.32)	(13.93)	(13.29)	(13.23)	(11.89)	(11.09)
ROA	-0.1484***	-0.1540***	-0.1476***	-0.1385***	-0.0982***	-0.0791***
	(-4.37)	(-4.53)	(-4.34)	(-3.97)	(-2.65)	(-2.06)
R_Z	-0.0345***	-0.0330***	-0.0345***	-0.0344***	-0.0327***	-0.0372***
	(-7.42)	(-7.09)	(-7.43)	(-7.24)	(-6.46)	(-7.07)
LAGE	0.0123	0.0114	0.0121	0.0220	0.0187	0.0128***
	(0.62)	(0.57)	(0.61)	(0.99)	(0.72)	(0.48)
Intercept	-0.3544***	-0.3544***	-0.3547***	-0.3904***	-0.2802***	-0.2642***
	(-4.22)	(-4.19)	(-4.23)	(-4.34)	(-2.72)	(-2.5)
R-squared	0.2195	0.2269	0.2381	0.2169	0.2200	0.2095

In sum, the results presented above provide strong support to our hypothesis that higher accruals quality reduces information asymmetries between firms and financial intermediaries, which permits those firms with higher accounting quality to obtain a better access to bank debt. These results are robust to different econometric specifications considering unobservable heterogeneity and endogenity problems, and for six different proxies of accruals quality (Dechow and Dichev, 2002; McNichols, 2002; Ball and Shivakumar, 2006; and the standard deviation of the residuals from the industry-year estimations of these three models) and two proxies of bank debt (bank debt over total assets, and bank debt over total debt).

6. CONCLUSIONS

In this paper we examine the effect of accruals quality on the access of firms to bank debt for a sample of Spanish SME, and find that higher accruals quality, i.e., more precision of earnings in relation to cash flows, is associated with more presence of bank debt with respect to total debt and total assets. Since the quality of accounting information can be considered an inverse indicator of information asymmetry, this finding is consistent with the financial literature that has shown that, in private debt markets, the use of bank debt is partially determined by information asymmetry. Moreover, this result also confirms, as stated in previous accounting research, that by reducing the information risk faced by the providers of funds, higher accruals quality has economic implications for firms. In this paper we show that improving accounting quality is relevant not only for obtaining better contracting conditions but also for accessing to bank loans.

These results are valuable because in Spain, a European country with a bank-based financial system, where SMEs do not have access to capital markets, these firms have two ways of obtaining financial resources: reserves, which is the main destination of profits, and bank loans, which constitute their main source of external funds (45.7% of total debt). Therefore, the implication of our results is clear for the financial management of these firms: since the possibility of dividends is unusual in these firms because they usually retain all their earnings, and even with this source of funds they sometimes face problems in financing their operation cycles, our results suggest that they can rely on higher earnings quality, i.e., more precise earnings with respect to cash flows, in order to reduce information asymmetries with banks and have easier access to bank funds.

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